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forming the subject of the present article, is very interesting because it gives complete temperature data from the ground up to 17,700 meters, or 11 miles. This is 650 meters higher than the highest ascension from St. Louis, which, by a coincidence, was also the first one to be made there. On May 7 a general storm prevailed, so that the balloon, travelling from the east, was soon lost in the cloud and its subsequent drift could not be followed, but the resultant course was 59 miles from the southwest, as determined by the place where the instrument fell two hours later.

"At the ground the temperature was 4°.5 C., and this decreased as the balloon rose to the base of the cloud, which itself was considerably warmer than the underlying air.

"Above the cloud the temperature continued to fall with increasing rapidity up to a height of 12,500 meters (nearly eight miles) where the minimum of —54°.5 C. was registered. Here the great warm stratum was entered and penetrated farther than ever before in this country, namely, to the height of 17,700 meters, where the temperature was —45°.6 C. An increase of 10° occurred, however, in the first 3,000 meters, for above 15,500 meters nearly isothermal conditions prevailed, confirming the belief of Teisserenc de Bort that what he calls the "stratosphere" is composed of a lower inverting layer with isothermal conditions above extending to an unknown height. In an ascension last November in Belgium the relatively warm stratum was found to extend from 12,900 meters to the enormous height of 29,000 meters, or 18 miles, where there was still no indication of its diminution."

GEOGRAPHICAL RECORD

THE AMERICAN GEOGRAPHICAL SOCIETY

Meetings of the Society. A special meeting of the Society was held on Monday evening, Dec. 6, 1909, at the Engineering Societies Building, when Commander Robert E. Peary, U. S. N., delivered an address on "The Discovery of the North Pole." The Hall was crowded and many were unable to gain admittance. President Huntington, in introducing the explorer, said:

"It is my great privilege this evening to introduce to you, not alone the man whose unwearied efforts have so wonderfully broadened our knowledge of the world, but the man who by his own choice and the sacrifice of the best he had to give—the years of his life—becomes for us a type and expression of our own aspirations. The endeavor of Commander Peary is a demonstration in an individual of the idealism of our race; that eager willingness to face all chances that the sign manual of humanity may be placed on the outermost edge of the humanly attainable. Such work is a vindication of immortality—a defiance to time."

Commander Peary showed a large number of lantern views illustrating his last expedition, from the passage of the *Roosevelt* through the Smith Sound Channels to its winter quarters at Cape Sheridan, the sledge route to Cape Columbia which was the starting point for the journey of 475 statute miles to the North Pole, and many phases of the eventful march over the sea ice, such as hauling the sledges across the pressure ridges, the ice huts at the camps, the method of taking observations for position, ice scenes at the Pole, etc. His address was the condensed story of the great achievement which, as he said, was the result of the perfected organization, methods and material growing out of many years of experiment and study.

A regular meeting of the Society was held at the Engineering Societies' Building, No. 29 West Thirty-ninth Street, on Tuesday evening, Dec. 21, 1909. Vice-President Greenough in the chair.

The following persons, recommended by the Council, were elected to Fellowship:

Frank Bailey,
John L. Cadwalader,
Ramon Cuiteras,
Alfred W. Hoyt,
Charles P. Huntington,
Jesse Albert Locke,
James Marwick,
Eugene Meyer, Jr.,
Charles L. Parmelee,
Charles W. Parsons,
William L. Porter,
Rev. Philip M. Rhinelander,
Thomas Shaw Safe,
Charles W. Seabury,
Dr. Louis Livingston Seaman,
Jefferson Seligman,
Morris W. Seymour,
Miss Anna Riker Spring,
James Gordon Steese,
R. F. Warner.

The Chairman then introduced Professor Charles Ernest Fay of Tufts College, who addressed the Society on "Across Uganda to the Mountains of the Moon." Stereopticon views were shown.

On motion, the Society adjourned.

Honors Awarded. At a meeting of the Council of the Society, on Dec. 16, the Cullum Medal was awarded to Mr. Ernest H. Shackleton, the Antarctic explorer, who, on Jan. 9, 1909, after a long journey southward over the Barrier Ice and the Antarctic continent, reached a point within 97 geographical miles of the South Pole.

At the same meeting, the Council awarded the Daly medal to Mr Charles Chaillé-Long, who, in 1874, navigated the Victoria Nile, discovered Lake Ibrahim and completed the proof that the river issuing from Victoria Nyanza is the Nile.

NORTH AMERICA

Relief Model of Illinois. The Geological Department of the University of Wisconsin has prepared a geological relief model of Illinois for the University of Illinois. Its horizontal scale is five miles to an inch and vertical scale, 1,320 feet to one inch. The model is six feet seven inches by three feet nine inches. The topography is based upon the contour maps prepared in 1892 under the direction of Prof. C. W. Rolfe for the Chicago World's Fair and upon the topographic maps of the United States Geological Survey, the Mississippi River Commission, etc. The geology is mostly from the geological map prepared by Prof. Stuart Weller for the Illinois Geological Survey.

THE GEOLOGIC MAP OF NORTH AMERICA. The Geological Society of America, at its meeting in Ottawa, in 1905, appointed a committee to prepare a general geological map of North America. The committee consisted of the late I. C. Russell (chairman), J. G. Aguilera, Bailey Willis, F. D. Adams, and C. W. Hayes. The completed map and two explanatory pamphlets by Messrs. Willis and Aguilera were presented at the meeting of the Tenth International Geological Congress held in the City of Mexico in September, 1905. Though the map was criticised in some respects, it was the first adequate step towards the filling of a long-felt want, and the map has served a very useful purpose. The U. S. Geological Survey has recently been revising the map with a view to republication, and the preliminary draft of the new map is now ready for inspection, by all who are interested, at the office of the Survey in Washington.

STATE GEOLOGICAL AND NATURAL HISTORY SURVEY OF CONNECTICUT. The Third Biennial Report (Bull. 12) recapitulates what has been done, the work in progress and the future work in geology. The two subjects of investigation are the geology and the natural history (botany and zoölogy) of the State. The geological investigations relate chiefly to surface geology or the study of the phenomena connected with the work of the great ice sheet of the Glacial period. Apart from the problems of surface geology, the area most thoroughly studied is that of the Triassic formation. The area where detailed work is most deficient, as yet, is that of the eastern crystallines. But there is more necessity, at present, for the more detailed study of the surface geology than that of the underlying rocks.

TIDE TABLES FOR THE EASTERN COASTS OF CANADA FOR 1910. These tables prepared by Dr. W. Bell Dawson have been issued by the Tidal and Current Survey, Department of Marine and Fisheries, Ottawa. The data on which the tables are based have been obtained by means of self-registering tide-gauges that are constantly in operation. As these observations have been kept up for a long time, it is found that the tables deduced from them are sufficiently accurate to be very useful. The records of the tide-gauges are reduced by the latest methods of obtaining the tidal constants, and from these the tables are calculated by the Nautical Almanac Office in London.

SOUTH AMERICA

THE TUNNEL ACROSS THE ANDES. The *London Times* says that this tunnel was broken through in the last days of November and that by March it is expected to run trains between Buenos Aires and Valparaiso. The tunnel will be about three miles long, with the summit level of the railroad about 10,460 feet above the sea. The works at the Argentine end were begun in October, 1905, and the Chileans began their end of the tunnel a little earlier. The enterprise has been carried on under much difficulty owing to the nature and position of the rock. The tunnel was driven through the top of the mountain, which is composed of stratified rocks, tilted at a high angle, with some of the strata almost vertical. Owing to the constant percolation of melting snow, the rocks are decomposed to a great distance below the surface, especially along the planes of stratification and in fissures.

The rocks through which the eastern half of the tunnel was cut are chiefly limestones with beds of gypsum, layers of sandstone, some narrow clay bands, as if along the line of faulting, and some beds of conglomerate full of very hard, rounded water-worn pebbles and small boulders. Especially near the eastern end of the tunnel all joints and fissures are so decomposed that the rocks were found to be very loose.

Quite different conditions were found at the western end. The rocks there are mainly felspathic, with hard, tough clay in veins. These rocks endure much better than those of the eastern side, though they have many joints and cleavage planes. The western side of the mountains has the steeper slope and the rocks are much more solid. It was necessary, however, to line the tunnel throughout, for, though many of the rocks may in themselves stand the extremes of heat and cold, no dependence can be placed on any of the cleavage planes.

THE HEIGHT OF MOUNT HUASCARAN. Mrs. Fanny Bullock Workman has sent information to the press that in July last she despatched M. de Larminat and two other competent French topographers from Paris to Mount Huascaran, Peru, one of whose twin peaks was ascended in 1908 by Miss Anna Peck. They were to make scientific determinations of the height of these peaks. Mrs. Workman adds:

"They executed a careful and detailed survey from the sea to Yungay, and by actual measurement established the heights of four stations in the Black Cordillera, from each of which they triangulated the two peaks of Huascaran.

"The results are: Height of north peak, 21,812 feet; of south peak, 22,187 feet. These figures may vary by a few feet, but not many, when the calculations are finally gone over by M. Vallat for verification. Mount Aconcagua, nearly 22,900 feet, still remains, as I predicted, and as Sir Martin Conway and other Andean explorers have always maintained, the highest peak of South America."

AFRICA

DR. PÖCH'S STUDIES AMONG THE BUSHMEN OF SOUTH AFRICA. The Society has received a letter from Dr. R. Pöch announcing that he has finished his travels in the Kalahari and his studies of the Bushmen tribes. His researches were made under the auspices of the Imperial Academy of Science of Vienna. In 1907, he went to German Southwest Africa and reached the Kalahari Desert *via* Windhuk and Gobabis. The whole of 1908 was spent in "trekking" by ox wagon through the Kalahari, from west to east. At five points he stopped from three weeks to three months. Four different tribes were thoroughly studied: the Heillum, Aullein, Ai-khoe, and Ohê-khoe.*

Measurements, photographs, phonographic records, and cinematographic pictures were taken. The Kalahari Bushmen in their daily life and customs still exhibit the characteristics of their fathers, but in physical appearance they show their relationship to the Negro and the Hottentot. Some of their languages are closely related to that of the Hottentots.

The first half of 1909 was given to studies of the last remnants of the Cape Bushmen (Kham tribe), which is a much purer representative of the genuine Bushman, but is now almost extinct.

Dr. Pöch finished his researches with a second journey in the Kalahari.

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* These names are not spelled here, according to Dr. Pöch's transliteration, as he employs some specially designed characters.

Starting from Upington on the Orange River, he crossed the sand wastes to the north in different directions, reached Kuis in the Molopo Valley and travelled up the Nosob Valley nearly to the German border. South of the Molopo, he found the Nu, who are closely related to the Cape Bushmen. His journeys in the desert covered more than 2,000 miles and stretches up to 200 miles were crossed without water, men and animals quenching thirst only on watermelons. He is now at his home in Vienna, working out his materials.

ASIA

DISCOVERIES BY DR. LONGSTAFF. The recent expedition of Dr. Longstaff in the Himalaya made important discoveries which are reported in the ***London Times*** (Weekly edition, Dec. 24, 1909). He made for the Saltoro Pass, in the Karakoram, because he knew that the main axis of this western part of the Himalaya had never been crossed by any traveller between Younghusband's Mustagh Pass and the Karakoram Pass itself, a distance of 100 miles in a straight line. The name Saltoro Pass has been handed down by tradition, but there is no record of any one having crossed it and its exact position was uncertain.

When he and his companions crossed this pass (18,200 ft.), on June 15 last, they saw before them a huge glacier, bounded to the north and east by a lofty range of snowclad peaks. They found that this glacier was flowing south, though represented on the maps as flowing north. In September, Dr. Longstaff returned to this Siachen glacier (Saichar on the maps) and found it to be 44 miles long, instead of some 20 miles as had been supposed. It pierces the range that has hitherto been regarded as the main Karakoram axis.

The Siachen is thus shown to be the largest glacier in the Himalayan system and probably the largest outside the Alaskan and Polar regions, its only competitor being the Inytchek glacier in the Tian Shan. As the Siachen glacier drains into the Nubra River, the basin of the Indus must extend much further north than had been supposed. In short, the Indus-Yarkand water-parting here follows a chain of mountains not shown on any maps and some 20 miles north of the high range upon which it has been hitherto located.

Another very interesting discovery was that of a group of lofty peaks crowning this new chain of the Karakoram and culminating (about 35° 30′ N. Lat.; 70° E. Long.) in Teram Kangri, 27,610 ft. If the explorer's measurements can be accepted, this new peak is over-topped only by Mount Everest, K2, Kinchinjunga and Makalu.

POLAR

PEARY'S ATTAINMENT OF THE NORTH POLE. On Nov. 3, 1909, the Sub-committee of the Research committee of the National Geographical Society, Washington, reported that it had carefully examined Commander Peary's original journal, records of observations, instruments, etc., and was "unanimously of the opinion that Commander Peary reached the North Pole on April 6, 1909." A gold medal was awarded to him and another to Capt. Bartlett, the navigator of the *Roosevelt.*

DECISION ADVERSE TO DR. F. A. COOK'S CLAIM. The Committee appointed by the University of Copenhagen to consider the evidence upon which Dr. F. A.

Cook rested his claim that he had attained the North Pole on April 21, 1908, reported that the documents which he submitted afforded no proof that he had been to the North Pole.

CAPTAIN ROBERT F. SCOTT'S ANTARCTIC EXPEDITION. The British Government has promised $100,000 towards this projected expedition. About $60,000 has been raised by subscription and Capt. Scott says there is no doubt that the remaining $40,000 required will be obtained.

He expects to start south this summer and, in January or February next year, establish two bases on the Barrier Ice whose northern edge forms the Great Barrier Wall. One of these bases will be at South Victoria Land and the other at King Edward VII Land, about 450 miles apart. Each of these bases will be about 850 statute miles from the South Pole, and from them it is expected to make an extensive examination of the Barrier Ice; also, from one or another of them to make the journey to the Pole. Capt. Scott says that motor sledges and others drawn by ponies and dogs will be used on the south polar journey. He has sent to Siberia for dogs and ponies. In his final march for the Pole, he expects to have sixteen men with him. He will take supplies for three years, and, even if he reaches the Pole in the first season, he expects to spend the summer of 1911-12 in further explorations.

CLIMATOLOGY

EARLY CIVILIZATIONS IN EUROPE AND AMERICA. In his inaugural lecture as Kaiser Wilhelm Professor at Columbia University (published in *Science,* Feb. 26, 1909, and the *Scot. Geog. Mag.,* July, 1909), Professor Albrecht Penck brought out, in an interesting manner, some of the larger facts regarding the early civilizations of Europe and America in relation to climatic controls. European civilization, there is no doubt, had its origin in the Orient. In Mesopotamia and Egypt an early civilization arose under arid and semi-arid conditions, based on irrigation, and this civilization was spread by the early navigators over the whole Mediterranean basin, where it everywhere found congenial conditions. In America the conditions under which early civilization was developed on the Mexican plateau were in many respects similar to those in the Orient. But the Mexican civilization was more feeble, and it could not extend in the same way. The American Mediterranean is much larger than the European, and early navigators did not find here the same landmarks which made it possible for the Phœnicians and the Greeks to sail so far. Furthermore, the shores of the American Mediterranean were not as inviting to settlers as those of Greece, Italy, Spain or northern Africa, for the former are covered widely with forests, dense and penetrable only with great difficulty. In fact, a belt of these virgin forests hindered the Mexicans from extending their civilization down to the Gulf of Mexico. The Gulf has, therefore, never played a rôle like that of the Mediterranean. The forests of peninsular North America were far out of reach of the original American civilization, which could not spread over the shores of the American Mediterranean, nor across the arid regions and deserts north of Mexico. Thus the Indian inhabitants remained here in the state of hunters, and did not clear the woodland. It was only after European settlers came, who had learned in Europe to overcome the resistance of forests to agriculture, that the natural riches of the forested area of North America were developed. R. DEC. W.

OBITUARY

Col. George Earl Church. This well-known civil engineer and geographer died in London, on Jan. 5, aged 74 years. He possessed probably a wider and more complete knowledge of the history, the geography, and the resources of tropical South America than any other authority. For many years he travelled extensively in the heart of the continent, and the information thus acquired was supplemented by a life-time of study of the experiences of other travellers, both past and present. By birth a citizen of the United States, Col. Church resided during the later years of his life in London. He was president of the Geographical Section of the British Association in 1898 and was long active as a member of the Council of the Royal Geographical Society and as a contributor to its *Journal.*

PERSONAL

Professor William M. Davis lectured before the Geological department of Colgate University on Dec. 20. His subject was "The Italian Riviera Levante."

Professor R. E. Dodge of Teachers College, Columbia University, lectured at the University of Wisconsin on Wednesday, Dec. 1, on "The New Movement in Secondary School Geography."

Dr. John M. Clarke, State Geologist of New York, has received the honorary degree of Doctor of Science from Colgate University.

At the annual banquet of the Geographic Society of Chicago on Jan. 26, the Helen Culver gold medal of the Society was presented to Prof. Thomas C. Chamberlin and also to Commander Robert E. Peary, U. S. N.

Mr. Shackleton, the Antarctic explorer, has been created a Knight by King Edward VII. Since his return from the Antarctic, he has also received many of the highest honors conferred by geographical societies.

Prof. William H. Holmes on Jan. 1 severed his official connection with the Bureau of American Ethnology and resumed his place as head curator of anthropology in the U. S. National Museum. He also becomes curator of the National Gallery of Art. His preference has always been for museum work.

Mr. F. W. Hodge on Jan. 1 entered upon his duties as chief of the Bureau of American Ethnology. The position, being vacated by Prof. W. H. Holmes, naturally falls to Mr. Hodge on account of his many years of intimate acquaintance with its operations.

Prof. Dr. Penck of Berlin and Prof. Dr. Partsch of Leipzig have been elected corresponding members of the Academy of Sciences in Munich.

Dr. Karl Sapper, Professor of Geography at the University of Tübingen, has been invited to take the chair of Geography in the University of Strassburg as successor to Prof. Dr. Gerland.